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File Code: 3420 **Date:** November 19, 2003
Route To:

Subject: Proposed Williams Follow-up Mistletoe Treatment Project, Williams RD (williamsrd)

To: District Ranger , Williams RD

Introduction

This letter serves as an evaluation for the proposed FY 2004 Williams Follow-up Mistletoe Treatment Project submitted by Mark Herron, Silviculturist, with your District. Mark and I met and evaluated some of the sites in late October. The subject proposal has been submitted to cover the costs associated with completing National Environmental Policy Act (NEPA) analysis of the project area.

All sites had received commercial and/or noncommercial silvicultural treatments within the past 15 years, and dwarf mistletoe levels were reduced in order to achieve treatment objectives. Now that some sites have regenerated and/or dwarf mistletoe infection levels have increased, Mark has determined that follow-up treatments are necessary. The NEPA analyses associated with previous treatments have expired and new analyses must be completed in order for the next stage of dwarf mistletoe control to take place. Mark intends to submit another proposal in FY 2005 to cover the costs of implementing the treatments decided upon during this analysis phase. At that time, I will complete an evaluation to address the proposed treatments.

Proposed Treatment Areas and Southwestern Dwarf Mistletoe Infection

The project proposes to analyze 36 sites (1,214 acres) for noncommercial treatments. Sites proposed for treatment are in ponderosa pine or pine-oak forest type spread throughout the District. These areas were selected based on walkthrough examinations, which are summarized in **Table 1** and include the name of the commercial treatment, acres, wildlife habitat designation, wildland-urban interface (WUI) designation, National Fire Plan condition class and fire regime rating, dwarf mistletoe (dm) severity rating, and threat of dm infection to established regeneration.

On many sites, lightly to moderately infected trees were retained as a seed source during the last commercial and/or noncommercial treatment in order to regenerate the site. These infected overstory trees are now threatening the newly established regeneration. In other areas, thinning had taken place in pole stands and dwarf mistletoe infection has increased. Monitoring and follow-up treatments were part of the District's original silvicultural plan for these areas.

Table 1. Sites Selected for the Williams Follow-up Mistletoe Treatment Analysis.

Units	Commercial Tmt. Name	Acres	Wildlife Designation	WUI	Condition Class	Fire Regime	Mistletoe Level	Regen. Threat
1 thru 8	Reneke	348	MSO/restricted	Yes	II or III	I	Low	Moderate to High
9 thru 11 19 thru 20	Oak	109	MSO/restricted	No Yes	II or III	I	Low to Moderate	Low to High
12 thru 14	Found	80	MSO/restricted	No	II or III	I	Moderate	Moderate
17 and 21	Sycamore	193	MSO/restricted Goshawk/PFA	No Yes	II or III	I	Moderate	Moderate
18	Pine Springs	29	MSO/restricted	No	II or III	I	Moderate	High
22 and 23	Moritz	80		Yes	II or III	I	Low to High	Low to High
24 thru 30	El Paso	230	Some restricted	No	II or III	I	Low to Moderate	Moderate to High
31 thru 33	Kaufman II	82		Yes	II or III	I	Low to High	Moderate to High
34 thru 35	McDermit	6		Yes	II or III	I	Low to Moderate	Moderate to High
36	Parks	20		Yes	II or III	I	Moderate to High	High

Biology of Mistletoe Spread

Dwarf mistletoes have a fairly complicated and long life cycle. Seeds of dwarf mistletoes are explosively released and expelled to distances typically ranging from 10 to 40 feet. Infection takes place through the bark on needle-bearing portions of twigs. Dwarf mistletoes first produce an endophytic system, a specialized rootlike structure that is in contact with the phloem and xylem of host trees, from which the parasite obtains most of its nutrients and water. Aerial shoots appear between 2 to 5 years after infection; fruit development occurs 2 to 3 years later. The period of infection before shoots are visible is known as the latent period.

Spread of dwarf mistletoe is a function of stand structure, density, age, and site index. Spread from overstory to understory is the most rapid, because it is multidimensional. Initially, all infections in the young stand develop directly from seeds produced from overstory trees. Then there is a transition period when infections in the young stand begin to produce seeds that further infect the stand. Subsequently, infection in the young stand progresses outward beyond the range of the seeds produced in the overstory stand. Spread through even-aged stands, beyond the limit of seed from an overstory source, is termed **lateral spread**.

Researchers[1] [2] measured the distance of infected seedlings from the source of overstory trees at different time intervals. In stands about 20 years old, nearly all infection was found to be attributable to seed produced in the overstory with 80 percent of infected seedlings within 35 feet of the infected overstory trees. In 50-year-old stands, lateral spread accounted for about one-half of the spread in open stands and one-third of the total in dense stands, with distances from the original overstory seed source reaching nearly 80 feet and 65 feet, respectively.

Recommendations

The District is commended for their monitoring protocol, in which they have surveyed 2,700 acres of sites that had previous commercial and noncommercial treatments. They were able to determine 1,214 acres need analysis for follow-up treatments. An investment was made when many sites now proposed for analysis were treated to reduce the impacts of dwarf mistletoe infection.

Since the District made the initial investment into these sites, funding the proposed analysis is the next logical step in order to take advantage of an effective treatment opportunity. During the analysis phase, killing infected overstory trees (by girdling) will be considered in order to slow the spread and intensification of dwarf mistletoe infection to the newly established regeneration. In sites with single-storied pole-sized ponderosa pine trees, further removal of infected trees will be considered in order to allow the residual trees to mature and eventually provide a seed source for regenerating the sites with infection free regeneration.

Because of the ips bark beetle outbreak on the District, we recommend the following slash treatment guidelines be used in this project:

1. Generate slash between late summer and the end of December, if possible.
2. Remove from the site or treat all slash greater than four inches in diameter. Slash less than four inches poses less risk.
3. If creating slash piles, place them in stand openings as much as possible and place the largest diameter slash on the outside of the pile to promote quick drying. Tepee style slash piles with branches and small-diameter slash in the middle and the larger diameter material on the outside.
4. If the largest diameter slash is on the outside of the piles, this material can be scorched with a terra torch either later this fall or early next spring (i.e., before April). The material does not need to be completely burned, just scorched enough to cook the cambium. Of course, if the whole pile can be burned, so much the better.
5. The larger diameter slash can also be chipped, buried, or peeled. If chipping, try to maximize the distance from the chip piles to the nearest tree. There are no specific guidelines as yet, but the farther the better.

[1] Gill, L.S. and F.G. Hawksworth. 1954. Dwarfmistletoe control in southwestern ponderosa pine forests under management. Jour. Forestry 52: 347-353.
[2] Hawksworth, F.G. 1961. Dwarfmistletoe of ponderosa pine in the Southwest. Tech. Bull. 1246. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station. 13p.

If large-diameter slash will be given away as free use firewood, inform the public not to pile the green slash next to trees in their yard. Preferably, the firewood should be bucked into short lengths (i.e., less than 14 inches), peeled, split, and placed in direct sunlight.

If you have any questions regarding this evaluation, please let us know. We can be reached at (928) 556-2075 (mfairweather@fs.fed.us, Mary Lou) or (928) 556-2073 (janhold@fs.fed.us, John Anhold).

/s/ Mary Lou Fairweather
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cc: John Anhold, Debra Allen-Reid, Douglas L Parker, Mailroom R3 Kaibab, Mark W Herron